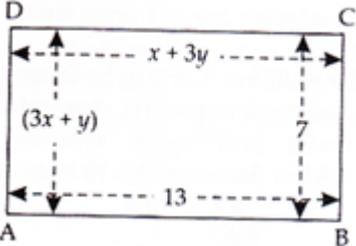


PAIR OF LINEAR EQUATION IN TWO VARIABLE WS 3

Class 10 - Mathematics

Section A

1. Solve the following system of linear equations: $35x + 23y = 209$; $23x + 35y = 197$. [3]
2. Solve the pair of linear equations $s - t = 3$ and $\frac{s}{3} + \frac{t}{2} = 6$ by substitution method. [3]
3. The sum of a two digit number and the number obtained by reversing the order of its digits is 121, and the two digits differ by 3. Find the number. [3]
4. If $217x + 131y = 913$ and $131x + 217y = 827$, then solve the equations for the values of x and y . [3]
5. Solve the pair of linear equations $\sqrt{2}x - \sqrt{3}y = 0$ and $\sqrt{3}x - \sqrt{8}y = 0$ by substitution method. [3]
6. Jaya scored 40 marks in a test getting 3 marks for each correct answer and losing 1 mark for each incorrect answer. Had 4 marks being awarded for each correct answer and 2 marks were deducted for each incorrect answer then Jaya again would have scored 40 marks. How many questions were there in the Test? [3]
7. The sum of digits of a two digit number is 15. The number obtained by reversing the order of digits of the given number exceeds the given number by 9. Find the given number. [3]
8. The sum of a two-digit number and the number obtained by reversing the order of its digits is 165. If the digits differ by 3, find the number. [3]
9. The sum of two numbers is 16 and the sum of their reciprocals is $\frac{1}{3}$. Find the numbers. [3]
10. Solve for x and y : $6x + 5y = 7x + 3y + 1 = 2(x + 6y - 1)$. [3]
11. Draw the graph of the pair of equations $2x + y = 4$ and $2x - y = 4$. Write the vertices of the triangle formed by these lines and the y -axis. Also find the area of this triangle. [3]
12. Solve the system of equations by using the method of substitution: [3]
 $2x + 3y = 9$
 $3x + 4y = 5$
13. Find the values of x and y in the following rectangle: [3]

14. If $x + 1$ is a factor of $2x^3 + ax^2 + 2bx + 1$, then find the values of a and b given that $2a - 3b = 4$. [3]
15. A two-digit number is 3 more than 4 times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number. [3]
16. Find two numbers such that the sum of twice the first and thrice the second is 92, and four times the first exceeds seven times the second by 2. [3]
17. Solve the pair of linear equations $0.2x + 0.3y = 1.3$ and $0.4x + 0.5y = 2.3$ by substitution method. [3]
18. Find the solution of the pair of equations $\frac{x}{10} + \frac{y}{5} - 1 = 0$ and $\frac{x}{8} + \frac{y}{6} = 15$. Hence, find λ , if $y = \lambda x + 5$. [3]
19. In a cyclic quadrilateral ABCD, $\angle A = (2x + 4)^\circ$, $\angle B = (y + 3)^\circ$, $\angle C = (2y + 10)^\circ$ and [3]

$\angle D = (4x - 5)^\circ$ Find the four angles.

20. The sum of two numbers is 1000 and the difference between their squares is 256000. Find the numbers. [3]
21. If the numerator of a fraction is multiplied by 2 and the denominator is reduced by 5 the fraction becomes $\frac{6}{5}$. [3]
And, if the denominator is doubled and the numerator is increased by 8, the fraction becomes $\frac{2}{5}$. Find the fraction.
22. The angles of a cyclic quadrilateral ABCD are $\angle A = (6x + 10)^\circ$, $\angle B = (5x)^\circ$, $\angle C = (x + y)^\circ$, $\angle D = (3y - 10)^\circ$ [3]
Find x and y, and hence the values of the four angles.
23. Solve the following system of equations by substitution method. $x + y = 7$; $2x - 3y = 11$. [3]
24. Solve for x and y : [3]
$$\frac{x}{2} + \frac{2y}{3} = -1$$
$$x - \frac{y}{3} = 3$$
25. Solve the system of equations: [3]
$$x - y + z = 4$$
$$x + y + z = 2$$
$$2x + y - 3z = 0$$
26. Seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If [3]
the difference between the digits is 3, determine the number.
27. A fraction becomes $\frac{4}{5}$, if 1 is added to both numerator and denominator. If however, 5 is subtracted from both [3]
numerator and denominator, the fraction becomes $\frac{1}{2}$. What is the fraction?
28. Solve the following system of linear equations : $4x + 7y = 20$; $21x - 13y = 21$. [3]
29. Solve the system of equations by using the method of substitution: [3]
$$\frac{2x}{a} + \frac{y}{b} = 2$$
$$\frac{x}{a} - \frac{y}{b} = 4$$
30. Determine, algebraically, the vertices of the triangle formed by the lines $5x - y = 5$, $x + 2y = 1$ and $6x + y = 17$. [3]
31. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of **m** for which $y = mx + 3$. [3]
32. Solve system of equations: [3]
$$x + \frac{y}{2} = 4$$
$$\frac{x}{3} + 2y = 5$$
33. Solve the pair of linear equations $x + y = 14$ and $x - y = 4$ by substitution method. [3]
34. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$. [3]
35. Solve system of equations: [3]
$$3x - \frac{y+7}{11} + 2 = 10$$
$$2y + \frac{x+11}{7} = 10$$
36. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$. [3]
37. Solve algebraically the following pair of linear equations for x and y [3]
$$31x + 29y = 33$$
$$29x + 31y = 27$$
38. A fraction is such that if the numerator is multiplied by 3 and the denominator is reduced by 3, we get $\frac{18}{11}$, but [3]
if the numerator is increased by 8 and the denominator is doubled, we get $\frac{2}{5}$. Find the fraction.
39. By the graphical method, find whether the pair of equations [3]
$$x + y = 3,$$

$$3x + 3y = 9$$

is consistent or not. If consistent, solve it.

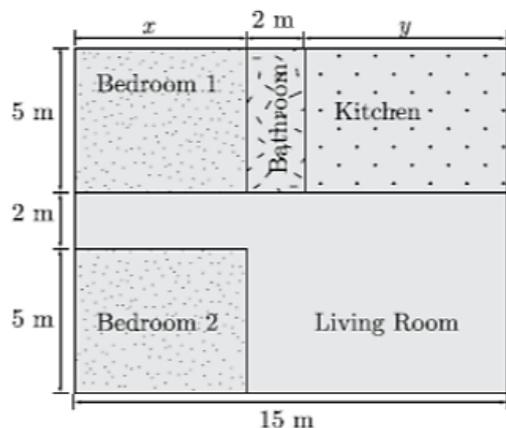
40. The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction. [3]
41. Find the angles of a cyclic quadrilateral ABCD in which $\angle A = (4x + 20)^\circ$, $\angle B = (3x - 5)^\circ$, $\angle C = (4y)^\circ$ and $\angle D = (7y + 5)^\circ$. [3]
42. A two-digit number is 4 times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number. [3]
43. Solve for x and y: [3]
 $\frac{x+1}{2} + \frac{y-1}{3} = 9$; $\frac{x-1}{3} + \frac{y+1}{2} = 8$
44. The difference between the two numbers is 26 and one number is three times the other. Find them by substitution method. [3]
45. A two-digit number is 4 times the sum of its digits and twice the product of the digits. Find the number. [3]

Section B

Question No. 46 to 49 are based on the given text. Read the text carefully and answer the questions: [4]

Architect : An architect is a skilled professional who plans and designs buildings and generally plays a key role in their construction. Architects are highly trained in the art and science of building design. Since they bear responsibility for the safety of their buildings' occupants, architects must be professionally licensed.

Vishu is a licensed architect and design very innovative house. She has made a house layout for her client which is given below. In the layout, the design and measurements has been made such that area of two bedrooms and kitchen together is 95 sq. m.



46. Which pair of linear equations does describe this situation?
47. What is the length of the outer boundary of the layout?
48. What is the area of the bedroom 1?
49. What is the area of living room in the layout?

Question No. 50 to 53 are based on the given text. Read the text carefully and answer the questions: [4]

TOWER OF PISA : To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time. An object dropped off the top of Leaning Tower of Pisa falls vertically with constant acceleration. If s is the distance of the object above the ground (in feet) t seconds after its release, then s and t are related by an equation of the form $s = a + bt^2$ where a and b are constants. Suppose the object is 180 feet above the ground 1 second after its release and 132 feet

above the ground 2 seconds after its release.



50. Find the constants a and b.
51. How high is the Leaning Tower of Pisa?
52. How long does the object fall?
53. At $t = 2$ sec, the object is at what height?

Section C

54. Two digit number is obtained by either multiplying the sum of digits by 8 and then subtracting 5 by multiplying the difference of digits by 16 and then adding 3. Find the number. [5]
55. If twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Find the ages of father and son. [5]
56. When 3 is added to the denominator and 2 is subtracted from the numerator a fraction becomes $\frac{1}{4}$. When 6 is added to numerator and denominator is multiplied by 3, fraction becomes $\frac{2}{3}$. Find the fraction. [5]
57. Solve system of equations: [5]
$$\frac{x}{7} + \frac{y}{3} = 5$$
$$\frac{x}{2} - \frac{y}{9} = 6$$
58. If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes $\frac{1}{2}$ if we only add 1 to the denominator. What is the fraction? [5]
59. The numerator of a fraction is 4 less than the denominator. If the numerator is decreased by 2 and the denominator is increased by 1, then the denominator is eight times the numerator. Find the fraction. [5]
60. The sum of the numerator and denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes $\frac{1}{2}$. Find the fraction. [5]
61. Solve system of equations: [5]
$$x + 2y = \frac{3}{2}$$
$$2x + y = \frac{3}{2}$$
62. A number consists of two digits whose sum is five. When the digits are reversed, the number becomes greater by nine. Find the number. [5]
63. Solve the pair of linear equations $\frac{3x}{2} - \frac{5y}{3} = -2$ and $\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$ by substitution method. [5]
64. The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and the denominator both are decreased by 1, the numerator becomes half the denominator. Determine the fraction. [5]
65. A two digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number. [5]
66. A two-digit number is such that the product of its digits is 20. If 9 is added to the number, the digits interchange their places. Find the number. [5]

67. Solve for x and y : [5]
 $2x - y + 3 = 0$
 $3x - 5y + 1 = 0$
68. A fraction becomes $\frac{1}{3}$ if 1 is subtracted from both its numerator and denominator. If 1 is added to both the numerator and denominator, it becomes $\frac{1}{2}$. Find the fraction. [5]
69. Solve the following system of equations by substitution method. $2x - 7y = 1$; $4x + 3y = 15$. Also verify the solution. [5]
70. The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them by substitution method. [5]
71. Solve system of equations: [5]
 $11x + 15y + 23 = 0$
 $7x - 2y - 20 = 0$.
72. The sum of the numerator and denominator of a fraction is 8. If 3 is added to both the numerator and denominator the fraction becomes $\frac{3}{4}$. Find the fraction. [5]
73. A two-digit number is 4 more than 6 times the sum of its digits. If 18 is subtracted from the number, the digits are reversed. Find the number. [5]
74. A fraction becomes $\frac{9}{11}$ if 2 is added to both numerator and denominator. If 3 is added to both numerator and denominator it becomes $\frac{5}{6}$. Find the fraction by substitution method. [5]
75. The sum of digits of a two digit number is 13. If the number is subtracted from the one obtained by interchanging the digits, the result is 45. What is the number? [5]